

## **CLAIMS:**

1. A method of managing transaction requests in a multi-node architecture, the method comprising:

forwarding a previously received ordered group request to a destination agent;

determining whether a next received ordered group request belongs to a same ordered group as the previously received ordered group request;

determining whether an ordering fork is encountered if the next received ordered group request belongs to the same ordered group as the previously received ordered group request;

if an ordering fork is encountered, determining whether a request complete message for the previously received ordered group request has been received; and

if the request complete message for the previously received ordered group request has not been received and the next received ordered group request in the same ordered group is at least one of a un-ordered request and a forward-ordered request, then forwarding the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a forward-ordered request and a sequential-ordered request issued on a different path at the ordering fork has been received.

2. The method of claim 1, further comprising:

forwarding the next received ordered group request to the destination agent if the next received ordered group request belongs to a different ordered group than the ordered group of the previously received ordered group request.

3. The method of claim 1, further comprising:

forwarding the next received ordered group request to the destination agent if no ordering fork is encountered.

4. The method of claim 1, further comprising:

forwarding the next received ordered group request in the same ordered group to the destination agent if the request complete message for the previously received ordered group request has been received.

5. The method of claim 1, further comprising:

if the request complete message for the previously received ordered group request has not been received and the next received ordered group request in the same ordered group is at least one of a backward-ordered request and a sequentially-ordered request, then forwarding the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a un-ordered, forward-ordered, backward-ordered and sequential-ordered requests issued on the different path at the ordering fork has been received.

6. A system of managing transaction requests in a multi-node architecture, the system comprising:

a requesting agent to issue one or more ordered group requests;

a receiving agent to receive the one or more issued ordered group requests and to examine the one or more issued ordered group requests; and

a destination agent to process the one or more issued ordered group requests, wherein the receiving agent to examine the one or more issued ordered group requests to determine whether a request complete message for a previously received ordered group request has been received, and if the request complete message for the previously received ordered group request has not been received and a next received ordered group request is at least one of a un-ordered request and a forward-ordered request, then the receiving agent to forward the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a forward-ordered request and a sequential-ordered request issued on a different path at an ordering fork has been received.

7. The system of claim 6, wherein receiving agent further determines whether the next received ordered group request belongs to a same ordered group as the previously received ordered group request.

8. The system of claim 7, wherein the receiving agent forwards the next received ordered group request to the destination agent if the next received ordered group request belongs to a different ordered group than the ordered group of the previously received ordered group request.

9. The system of claim 7, wherein the receiving agent forwards the next received ordered group request in the same ordered group as the previously received ordered group request to the destination agent if the request complete message for the previously received ordered group request has been received.

10. The system of claim 6, wherein the receiving agent forwards the next received ordered group request to the destination agent if no ordering fork is encountered.

11. The system of claim 6, wherein if the request complete message for the previously received ordered group request has not been received and the next received ordered group request is at least one of a backward-ordered request and a sequentially-ordered request, then the receiving agent forwards the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a un-ordered, forward-ordered, backward-ordered and sequential-ordered requests issued on the different path at the ordering fork has been received.

12. A receiving agent for managing transaction requests in a multi-node architecture, wherein the receiving agent comprising:

a processor to examine the one or more received ordered group requests and to determine whether a request complete message for a previously received ordered group request has been received, and if the request complete message for the previously received ordered group request has not been received and a next received ordered group request is at least one of a un-ordered request and a forward-ordered request, then the processor to forward the next received ordered group request to a destination agent after the request complete message for the previously received at least one of a forward-

ordered request and a sequential-ordered request issued on a different path at an ordering fork has been received.

13. The receiving agent of claim 12, wherein the processor further determines whether the next received ordered group request belongs to a same ordered group as the previously received ordered group request.

14. The receiving agent of claim 13, wherein the processor forwards the next received ordered group request to the destination agent if the next received ordered group request belongs to a different ordered group than the ordered group of the previously received ordered group request.

15. The receiving agent of claim 13, wherein the processor forwards the next received ordered group request in the same ordered group as the previously received ordered group request to the destination agent if the request complete message for the previously received ordered group request has been received.

16. The receiving agent of claim 12, wherein the processor forwards the next received ordered group request to the destination agent if no ordering fork is encountered.

17. The receiving agent of claim 12, wherein if the request complete message for the previously received ordered group request has not been received and the next received ordered group request is at least one of a backward-ordered request and a sequentially-ordered request, then the processor forwards the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a un-ordered, forward-ordered, backward-ordered and sequential-ordered requests issued on the different path at the ordering fork has been received.

18. A method for managing transaction requests in a multi-node architecture, the method comprising:

examining one or more received ordered group requests; and

determining whether a request complete message for a previously received ordered group request has been received, and if the request complete message for the previously received ordered group request has not been received and a next received ordered group request is at least one of a un-ordered request and a forward-ordered request, then forwarding the next received ordered group request to a destination agent after the request complete message for the previously received at least one of a forward-ordered request and a sequential-ordered request issued on a different path at an ordering fork has been received.

19. The method of claim 18, further comprising:  
forwarding a previously received ordered group request to the destination agent.
20. The method of claim 18, further comprising:  
determining whether the next received ordered group request belongs to a same ordered group as the previously received ordered group request.
21. The method of claim 20, further comprising:  
forwarding the next received ordered group request to the destination agent if the next received ordered group request belongs to a different ordered group than the ordered group of the previously received ordered group request.
22. The method of claim 20, further comprising:  
forwarding the next received ordered group request in the same ordered group as the previously received ordered group request to the destination agent if the request complete message for the previously received ordered group request has been received.
23. The method of claim 18, further comprising:  
forwarding the next received ordered group request to the destination agent if no ordering fork is encountered.
24. The method of claim 18, further comprising,

if the request complete message for the previously received ordered group request has not been received and the next received ordered group request is at least one of a backward-ordered request and a sequentially-ordered request, then forwarding the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a un-ordered, forward-ordered, backward-ordered and sequential-ordered requests issued on the different path at the ordering fork has been received.

25. A data signal embodied in a propagation medium, the data signal comprising:  
an ordered group identifier segment to indicate that the data signal belongs to a particular ordered group; and

an ordering bit segment to specify ordering semantics for processing transaction requests, wherein the ordering bit segment to indicate whether a previously received transaction request included in the data signal is at least one of a un-ordered, forward-ordered, backward-ordered and sequentially-ordered with respect to a next received transaction request that belongs to the same particular ordered group.

26. The data signal of claim 25, wherein the ordered group identifier segment further comprising:

a stream identifier segment to indicate that the data signal belongs to a particular ordered stream, wherein the data signal having the same stream identifier segment are semantically ordered with respect to each other.

27. The data signal of claim 25, wherein the ordered group identifier segment further comprising:

a node identifier segment to indicate that the data signal was issued by a particular node, wherein the data signal having the same node identifier segment are semantically ordered with respect to each other.

28. The data signal of claim 25, wherein the next received transaction request cannot be processed before the previously received forward-ordered transaction request that belongs to the same particular ordered group.

29. The data signal of claim 25, wherein the previously received backward-ordered transaction request can be processed after the next-received transaction request that belongs to the same particular ordered group.

30. The data signal of claim 25, wherein the next received transaction request cannot be processed before the previously received sequentially-ordered transaction request and the previously received sequentially-ordered transaction request cannot be processed before a next received transaction request that belongs to the same particular ordered group.

31. The data signal of claim 25, wherein the previously received un-ordered transaction request can be processed after a next received un-ordered transaction request that belongs to the same particular ordered group.

32. A machine-readable medium having stored thereon a plurality of executable instructions, the plurality of instructions comprising instructions to:

- forward a previously received ordered group request to a destination agent;

- determine whether a next received ordered group request belongs to a same ordered group as the previously received ordered group request;

- determine whether an ordering fork is encountered if the next received ordered group request belongs to the same ordered group as the previously received ordered group request;

- if an ordering fork is encountered, determine whether a request complete message for the previously received ordered group request has been received; and

- if the request complete message for the previously received ordered group request has not been received and the next received ordered group request in the same ordered group is at least one of a un-ordered request and a forward-ordered request, then forward the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a forward-ordered request and a sequential-ordered request issued on a different path at the ordering fork has been received.

33. The machine-readable medium of claim 32 having stored thereon additional executable instructions, the additional instructions comprising instructions to:

forward the next received ordered group request to the destination agent if the next received ordered group request belongs to a different ordered group than the ordered group of the previously received ordered group request.

34. The machine-readable medium of claim 32 having stored thereon additional executable instructions, the additional instructions comprising instructions to:

forward the next received ordered group request to the destination agent if no ordering fork is encountered.

35. The machine-readable medium of claim 32 having stored thereon additional executable instructions, the additional instructions comprising instructions to:

forward the next received ordered group request in the same ordered group to the destination agent if the request complete message for the previously received ordered group request has been received.

36. The method of claim 32, further comprising:

if the request complete message for the previously received ordered group request has not been received and the next received ordered group request in the same ordered group is at least one of a backward-ordered request and a sequentially-ordered request, then forward the next received ordered group request to the destination agent after the request complete message for the previously received at least one of a un-ordered, forward-ordered, backward-ordered and sequential-ordered requests issued on the different path at the ordering fork has been received.